NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

ANALYSIS OF THE EFFECTS SPECIAL PAYS HAVE ON RETENTION IN THE MEDICAL SERVICE CORPS

by

Christopher Lingard

March 2011

Thesis Co-Advisors: John Enns
William Hatch

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.			
1. AGENCY USE ONLY ***(Leave blank)***	**2. REPORT DATE** March 2011	**3. REPORT TYPE AND DATES COVERED** Master's Thesis	
4. TITLE AND SUBTITLE Analysis of the Effects Special Pays Have on Retention in the Medical Service Corps			**5. FUNDING NUMBERS**
6. AUTHOR(S) Lingard, Christopher P.			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number _____.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			**12b. DISTRIBUTION CODE** A

13. ABSTRACT (maximum 200 words)

This thesis examines the effects special pays have on retention in the Medical Service Corps (MSC). The research utilized special pay guidance and data from the Bureau of Medicine Information System (BUMIS) on officers who entered the MSC between 1997 and 2006.

Four basic and refined probit models using demographics and specialties were constructed to determine the effects of special pays on retention. Each model included a difference in difference estimator to measure the effects over time. The basic model estimated the effect of special pays on all specialties that receive a special pay. The refined models estimated the effects of special pays on retention for individual specialties, specifically psychologists, pharmacists, and optometrists.

Findings showed that when special pays are implemented, specialties that receive them have a decreased probability of leaving the service. Individually, pharmacists and psychologists had a decreased probability of leaving when their respective special pays were implemented. Optometrists had an increased probability of leaving when their special pay was implemented, a result that requires further research.

14. SUBJECT TERMS Medical Service Corps, Special Pays, Retention			**15. NUMBER OF PAGES** 53
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	**18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified	**19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified	**20. LIMITATION OF ABSTRACT** UU

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

ANALYSIS OF THE EFFECTS SPECIAL PAYS HAVE ON RETENTION IN THE MEDICAL SERVICE CORPS

Christopher P. Lingard
Lieutenant, Medical Service Corps, United States Navy
B.S., University of Wisconsin – Stevens Point, 2000
M.H.A., Medical University of South Carolina, 2004

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
March 2011

Author: Christopher P. Lingard

Approved by: John Enns
Thesis Co-Advisor

William Hatch
Thesis Co-Advisor

William Gates
Dean, Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

This thesis examines the effects special pays have on retention in the Medical Service Corps (MSC). The research utilized special pay guidance and data from the Bureau of Medicine Information System (BUMIS) on officers who entered the MSC between 1997 and 2006.

Four basic and refined probit models using demographics and specialties were constructed to determine the effects of special pays on retention. Each model included a difference in difference estimator to measure the effects over time. The basic model estimated the effect of special pays on all specialties that receive a special pay. The refined models estimated the effects of special pays on retention for individual specialties, specifically psychologists, pharmacists, and optometrists.

Findings showed that when special pays are implemented, specialties that receive them have a decreased probability of leaving the service. Individually, pharmacists and psychologists had a decreased probability of leaving when their respective special pays were implemented. Optometrists had an increased probability of leaving when their special pay was implemented, a result that requires further research.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I. INTRODUCTION 1
- **A. BACKGROUND 1**
  - **1. Medical Service Corps (MSC) 1**
  - **2. Special Pays 2**
- **B. PURPOSE OF THE STUDY 3**
- **C. RESEARCH QUESTIONS 3**
- **D. ORGANIZATION 4**

II. LITERATURE REVIEW 5
- **A. INTRODUCTION 5**
- **B. MILITARY HEALTHCARE RETENTION STUDIES: EFFECTS OF PAY ON RETENTION IN THE NAVY MEDICAL CORPS 5**
- **C. MILITARY HEALTHCARE RETENTION STUDIES: EFFECTS OF NON-MONETARY FACTORS ON RETENTION IN THE NAVY MEDICAL SERVICE CORPS 8**
- **D. SUMMARY 9**

III. DATA DESCRIPTION 11
- **A. DATA SOURCE 11**
  - **1. Bureau of Medicine Information System File 11**
  - **2. OPNAV Instruction 7220.17 ..... 11**
  - **3. NAVADMIN 12**
    - ***a. NAVADMIN 172/03 ..... 12***
    - ***b. NAVADMIN 320/07 ..... 12***
    - ***c. NAVADMIN 057/10 ..... 12***
    - ***d. NAVADMIN 074/10 ..... 12***
- **B. DATA RESTRICTIONS 13**
- **C. DESCRIPTIVE STATISTICS 13**
- **D. SUMMARY 16**

IV. METHODOLOGY 17
- **A. MODEL DESIGN 17**
- **B. MODEL SPECIFICATION 18**
  - **1. Basic Model 18**
  - **2. Refined Models 19**
- **C. VARIABLE DEFINITIONS AND EXPECTED EFFECTS 19**
  - **1. Dependent Variable (LEAVE) 19**
  - **2. Explanatory Variables 20**
    - ***a. Gender (Female, Male) 20***
    - ***b. Rank (ENS, LTJG, LT, LCDR,CDR) 20***
    - ***c. Race (White, Black, Other) 20***
    - ***d. Source of Commissioning (Dirproc, Fmenl, HSCP, OtherSource) 21***

e. Specialty (SpecialtyWOSP, Psychologist, Pharmacy, Optometry) *21*
f. Educational Level (Doctorate, Masters, Bachelor) *21*

V. RESULTS **23**
A. INTRODUCTION **23**
B. MODEL STRENGTH **23**
C. PRESENTATION OF EFFECTS AND PARTIAL EFFECTS **24**
1. Basic and Refined Models **26**
a. Explanatory Variables *26*
b. Variables of Interest *27*
2. Partial Effects **28**
D. SUMMARY **30**

VI. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS **31**
A. SUMMARY **31**
B. CONCLUSIONS AND RECOMMENDATIONS **32**
1. Primary Research Question 1 ..... **32**
a. Conclusion *32*
b. Recommendation *32*
2. Primary Research Question 2 ..... **33**
a. Conclusion *33*
b. Recommendation *33*
3. Secondary Research Question 1 ..... **34**
a. Conclusion *34*
b. Recommendation *34*
4. Secondary Research Question 2 ..... **34**
a. Conclusion *34*
b. Recommendation *35*

LIST OF REFERENCES **37**

INITIAL DISTRIBUTION LIST **39**

LIST OF TABLES

Table 1. MSC Specialties by Population 3
Table 2. Descriptive Statistics.....14
Table 3. Pseudo R Squared Values 23
Table 4. Model Results 24

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

I would like to thank my thesis advisors Professor John Enns and Professor William Hatch for their expert guidance and support. In addition, I would like to thank Professor Steve Mehay and Professor Yu Chu Shen for their significant assistance with the quantitative portion of this study. LT Neil Cascardo of Navy Medicine MPTE and Mr. William Marin of Navy Medicine Special Pays provided the necessary data. Additional thanks go to CDR Brendan Melody, the MSC Manpower Specialty Leader for the topic idea and his continuing support. A special thank you to my wife, Jennifer and son Corbin, for their unwavering support and patience throughout this process; without them, this could not have been possible.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. BACKGROUND

The ability of the United States military to meets its national security mission is dependent on its ability to attract, train and retain the appropriate number of personnel. Since the start of the all-volunteer force in the 1970s, this task has become all the more challenging. Research into the military's ability to access, train and retain personnel has been a focus for decades. Specific research examining retention in Navy Medicine has also been a focus, and continues to remain a priority today. While studies that analyze retention and its causes in the Medical Service Corps (MSC) exist, research that examines the effect special pays have on retention in the MSC has not been conducted. The following paragraphs will provide a more in-depth background of the MSC and the associated special pays.

1. Medical Service Corps (MSC)

The Navy MSC is one of the four Officer Corps in Navy Medicine. The MSC is comprised ofofficers from healthcare specialties with the exception of physicians, dentists and nurse corps. Over thirty specialties focus in three major areas: healthcare administration, clinical care, and research. The healthcare administration field covers all facets of administration in Navy medicine and includes various specialties from patient administration to financial management. The clinical care field includes non-physician specialists from physician assistants to pharmacists. The research field is based in medical research and includes specialties such as radiation health and industrial hygiene officers. The specialties focused on in this study, the specialties that receive a special pay, are all located in the clinical care field, and include psychologists, pharmacists and optometrists. In addition, physician assistants now receive a special pay, but since the pay was not implemented until FY2010, it was not included in this research.

Officers access into the MSC through several programs to include direct accession, the Health Services Collegiate Program (HSCP) and former enlisted members.

The level of education required for healthcare specialties leads to the majority of MSC Officers being accessed with a Masters degree or above. Depending on the individual officer's accession program, the costs for this level of education may have been paid for by either the Navy or service-member. These officers come from both genders and constitute all major racial and ethnic backgrounds.

Regardless of accession program, career progression is very similar from officer to officer. Each of the accession programs requires an initial active duty commitment of three years. This commitment could be modified by accession bonuses or participation in a loan repayment program, but for the purpose of this study, allofficers are considered to have an initial three-year commitment. Following the completion of the three-year commitment each officer can decide to continue or to leave the service. This initial decision is the first point in a career where retention becomes a consideration, and is the primary focus of this study.

2. Special Pays

In order to affect the stay/leave decision of officers at this initial decision point, the MSC has recently implemented a series of special pays. These special pays have several intentions, but for the purpose of this study, the overarching intention is to increase the retention rate for set specialties. The specialties that have been selected to receive a special pay include psychologists, pharmacists, and optometrists. Additionally, physician assistants have been selected but because of the timeframes have not been included in this study. These specialties account for a minority of MSC Officers, and along with the specialties that do not receive a special pay are shown in Table 1.

Table 1. MSC Specialties by Population

Specialty	Freq.	Percent	Cum.
SpecialtyWOSP	1,456	79.43	79.43
Psychologist	116	6.33	85.76
Optometry	132	7.2	92.96
Pharmacy	129	7.04	100
Total	1,833		

The special pay programs recently established by the MSC have included several different types of pays. The special pays have included accession bonuses, retention bonuses, incentive pays, and board certification pay. This research specifically focuses on retention pays. Each of the special pays have a distinct function, with the overarching function affect staffing in order to meet manning goals.

B. PURPOSE OF THE STUDY

The purpose of this study is to determine whether special pays have a significant effect on retention in the MSC. Retention is an important facet in the manning of the MSC, and has a significant effect on the Medical Service Corp's ability to meet its Navy Medicine mission. In order to raise the retention rates for certain specialties, the MSC has recently established a series of special pays. This study will examine whether or not these special pays are serving their intended purpose, and having a positive impact on retention.

C. RESEARCH QUESTIONS

The primary research questions are:

1. Does special pay have a statistically significant effect on retention rates in the Medical Service Corps?
2. What is the effect of special pay and its subsequent role in meeting Medical Service Corps retention goals?

The secondary research questions are:

1. How does the special pay effect on retention rates differ among Medical Service Corps specialties?
2. If significant effects exist for specialties currently receiving a special pay, could potential effects on retention rates exist for those specialties not currently receiving a special pay?

D. ORGANIZATION

This study is organized into six chapters. Chapter II provides a literature review discussing previous research in this field. Chapter III provides a description of the data utilized for this study, and a presentation of the descriptive statistics for that data. Chapter IV details the models used for the study, and describes each of the included variables. Chapter V presents the results associated with the models detailed in Chapter IV. Chapter VI provides the studies summary, conclusions and recommendation.

II. LITERATURE REVIEW

A. INTRODUCTION

Effective service-member retention is one of the most crucial factors that support the military's ability to meet its national security mission. Ever since the implementation of the all-volunteer force in the mid 1970s, the ability of the military to attract and retain the appropriate personnel has taken on a new level of importance. Previous research has shown that military members are very expensive to recruit, train and retain. Because of this, the ability of the services to retain these members in light of ever-changing internal and external economic conditions is critical.

There has been extensive previous research on Navy Medicine retention, but research specifically targeting the Medical Service Corps (MSC) has not been as plentiful. The MSC is a unique entity since it does not provide specialty specific training or education for a significant portion of its community. A sizeable number ofofficers who enter the MSC receive educational degrees in their chosen specialty outside of the Navy. The majority are able to function immediately in their specific healthcare field upon entering. While this uniqueness may conceivably reduce some training costs to the Navy, it may significantly alter retention. It is crucial that research into MSC retention receive further attention. For the foreseeable future, the MSC will continue to retain an experienced workforce as it meets its never-ending mission requirements.

B. MILITARY HEALTHCARE RETENTION STUDIES: EFFECTS OF PAY ON RETENTION IN THE NAVY MEDICAL CORPS

As Navy healthcare continues to grow, so does the need to retain healthcare personnel. Historically, healthcare personnel are the most difficult group to retain, causing the Medical Corps to be frequently studied. The types of physicians in the Medical Corps range from generalists to the most advanced specialists. Due to the advanced pay attributed to the civilian medical field, it has made it historically difficult for the military to retain physicians.

One of the major studies examining physician pay and the retention of physicians was a Center for Naval Analyses study conducted by Joyce McMahon in June 1989. The study entitled "A Retention Model for Navy Physicians" examines the effect of civilian-military pay differentials on retention rates for physician specialists. The civilian-military pay differential is the corresponding ratio between the military pay for the physician and the expected pay for the same physician in the civilian sector. As this gap increases, the subsequent incentive for the physician to leave the military for civilian opportunities increases. (McMahon, 1989) McMahon utilized data from the Bureau of Medicine Information Systems for military pay, and survey data from the American Association of Medical Colleges for the civilian pay information.

McMahon's study follows fully trained specialists who were serving on active duty fiscal years 1983 through 1987. The research examined data containing both pay (regular pay and special pays) and demographic information for each of theofficers. The special pay portion of the information included: variable special pay, board certified pay, additional special pay and incentive special pay. (McMahon, 1989)

The McMahon study examined different factors affecting the rate of retention in the Navy Medical Corps. One of the factors studied was the pay differential gap for each of the specialty and non-specialty physicians. McMahon found that the pay differential gap was much more negative towards the military for specialized physicians, especially physicians with extensive training and/or experience. While specialist physicians in the Navy had a significant pay gap with their civilian counterparts (averaged $25,200 in FY1988), McMahon found that non-specialist physicians were actually paid more than their civilian counterparts (average $16,100 in 1987). (McMahon, 1989)

McMahon also examined the effects of demographics, family preferences, motivation towards Navy service, potential for a military retirement, working conditions, and the source of entry for physicians.

McMahon used a logit model to examine retention as the dependent variable against each of the potential explanatory variables. The key finding was that as military to civilian pay differential decreases, a corresponding increase in the retention rate should

occur. (McMahon, 1989) In addition, McMahon found that having dependents increased the probability of leaving the military. (McMahon, 1989) Whereas, McMahon found that increased age, higher rank, being black or female, and being close to retirement eligibility all lower the probability of leaving. (McMahon, 1989) These findings were at the .05 level of significance or greater. In response to these findings, McMahon further studied the effect of the pay differential on retention for different physician specialties. She did this through the use of an elasticity measure that took into account the corresponding probability of leaving the military. Her findings illustrated that the effect of the pay differential on retention rates varied greatly depending on specialty. The elasticity measure for a very advanced specialty, neurosurgery was .72 where as the elasticity for a non-specialty pediatrician was .01. (McMahon, 1989) In other words the size of the pay differential between military and civilian providers has a very significant role in the retention rate for a specialty like neurosurgery where as it has a very negligible effect for a less specialized physician such as a pediatrician.

McMahon utilized her elasticity findings to compare the effects of several potential pay plans on the retention rates of Navy physicians. The first pay plan considered is to completely end the military to civilian pay gap for specialist physicians. McMahon calculates that this would have cost the Navy $23,300,000 in FY1989, and would have resulted in an additional 64 specialists retained to the Navy who would have otherwise left. (McMahon, 1989) This equates to a 3.8 percent increase in the Navy physician specialist inventory. The second pay plan chose to close the pay differential to 90%, meaning that military specialists would make approximately 90% of the earnings of their civilian counterparts. According to McMahon, this would cost the Navy $13,700,000 and would lead to the retention of an additional 38 specialists. (McMahon, 1989)

In summary, McMahon compares the projected costs and benefits of pay plans to the cost of living plan being considered by the Navy at the time. McMahon argued that the Navy's plan would have cost approximately $15,200,000 in order to recover lost purchasing power in physician salaries. (McMahon, 1989) The study's final recommendation argues that while the cost of raising the pay differential to 90% is

significant, it is less than the cost of living plan, and as such would provide a better option for increasing the retention of Navy physician specialists.

C. MILITARY HEALTHCARE RETENTION STUDIES: EFFECTS OF NON-MONETARY FACTORS ON RETENTION IN THE NAVY MEDICAL SERVICE CORPS

While extensive research has not been conducted on the effects of pay and compensation on retention of Medical Service Corps Officers, research has examined other retention factors.

One of the most recent research studies was a Naval Postgraduate School thesis conducted by Lieutenant Erich Dietrich in 2007. Dietrich's study compared the effects of the Global War on Terror (GWOT) and retention rates of Medical Service Corps Officers. His research utilized data on Medical Service Corps Officers who entered the service in 1998, 1999 and 2001. The premise of the study was to examine retention decisions ofofficers who entered the service before the events of September 11, 2001, and subsequent combat deployments. When these officers originally entered the service, the concept of a major war and the subsequent deployments that come afterwards were not a major consideration in their decision to serve. In order to address the primary research question: "since the initiation of the Global War on Terrorism, has there been an effect on retention rates with the Medical Service Corps for junior officers?" Dietrich utilized data on all MSC Officers who served on active duty between 1997 and 2005. (Dietrich, 2007) The data came from the Officer Master File (OMF), Health Manpower Personnel Data System (HMPDS), and the active duty pay file, and was compiled by the Defense Manpower Data Center (DMDC)

In order to analyze the data and determine the effect of the (GWOT) on MSC retention, Dietrich utilized multiple logistic regressions. The separate models focused on a deployment variable, a hostile/non-hostile deployment variable, a multiple deployments variable, and months of hostile deployments variable. In addition, each of the models utilized a difference in differences estimator in order to measure the effects over time.

The results from Dietrich illustrated the effects of the various independent variables on MSC retention. The general deployment variable (DEPLOYED) was shown to have a positive significant effect, at the .10 level, on retention of MSC first term officers. (Dietrich, 2007) When Dietrich utilized the FY_01 DEPLOYED variable to test the difference between deployments pre and post the start of GWOT, the variable was not shown to be significant at any level. In essence, the timing of the deployment did not have a significant effect on the retention of first term officers. In addition to the above general tests, Dietrich studied the differences between hostile and non-hostile deployments. Utilizing a variable for hostile deployments (HOSTILE), Dietrich determined that hostile deployments have a significant positive effect on the retention of first term MSC Officers. The remaining models utilized by Dietrich each studied variables found to be insignificant, namely the effects of multiple deployments (MULTDEP) and a variable that took into account the length of a hostile deployment (MONTHS_HOSTILE_DEPLOYMENT). (Dietrich, 2007)

Overall, the results from the Dietrich study showed that deployments in general and specifically hostile deployments have a positive significant effect on the retention of first term MSC Officers. Dietrich's research provides a significant look at the effect of non-pay factors on retention, and a model for how to study pay related effects.

D. SUMMARY

The retention of experienced military personnel is shown to be a factor from both an economic and military sense. Previous research shows that the effect of small changes in retention rates can have significant effects on the military's ability to meet mission requirements in a cost efficient manner. McMahon finds that increasing military pay for physician specialists to ninety percent of the FY1989 corresponding civilian rate would save approximately ten million dollars in comparison to increasing the pay to one hundred percent of the corresponding civilian rate. (McMahon, 1989) Dietrich's study notes that while retention was trending downward for the MSC (decreased by 9.09% from 1998 to 2001), deployments had a positive effect on retention. (Dietrich, 2007)

The studies examining retention in Navy Medicine have illustrated the uniqueness of retaining medical personnel in the military. Previous research has shown how important it is for personnel planners to understand the causes and effects of retention. In today's environment of rising costs, tight budgets and ever-present national security demands, it has become even more critical to understand the current factors driving retention in Navy Medicine.

III. DATA DESCRIPTION

A. DATA SOURCE

The dataset utilized in this study was obtained from LT Neil Cascardo at the Navy Medicine Manpower, Training and Education command. The data was extracted from the Navy Bureau of Medicine Information System (BUMIS). In addition to the BUMIS extraction, Medical Service Corps (MSC) special pay information was obtained from William Marin at the Navy Medicine Special Pays Office. This special pay information was derived from guidance covered by a series of NAVADMIN messages (NAVADMIN 172/03, 320/07, 057/10, 074/10) and OPNAV instruction 7220.17

1. Bureau of Medicine Information System File

The Bureau of Medicine Information System (BUMIS) is the master data file for Navy Medicine personnel. The dataset utilized represented all MSC officers who entered the service between 1997 and 2006, and tracked their careers through October 2010 at which point it is assumed each officer made an initial stay or leave decision. The dataset contained 1833 observations and variables for rank, gender, race, commissioning source, subspecialty code, estimated loss date, report date as an officer, and education level.

2. OPNAV Instruction 7220.17

The overarching instruction that establishes special pays for Medical Corps, Dental Corps, Medical Service Corps, and Nurse Corps officers is OPNAV Instruction 7220.17. The analysis focused on the interim guidance for special pay for Navy health professions officers (released on 18 February 2010). This interim guidance defines and establishes a series of special pays for health professions officers to include accession bonuses, incentive pay, retention bonuses, and board certification pay. The focus of this research is specifically on retention bonuses.

3. NAVADMIN

a. NAVADMIN 172/03

The announcement of the special pays program for MSC pharmacy and optometry officers accomplished through NAVADMIN 172/03. This retention bonus was established and put into effect on 1 August 2003.

b. NAVADMIN 320/07

The announcement of a critical skills retention bonus (CSRB) program for MSC Clinical Psychology Officers accomplished through NAVADMIN 320/07. This program was established in Fiscal Year (FY) 2008, and was superseded by NAVADMIN 057/10 in FY2010. The CSRB program applied to clinical psychologists who were between three and eight years of service as a clinical psychologist. The CSRB was a special pay that would pay $60,000 over the course of a four year contract. Officers could sign successive contracts through eight years of service, ultimately potentially receiving the pay through 12 years of qualified service.

c. NAVADMIN 057/10

The announcement of a new special pay plan was established for MSC health professions officers in NAVADMIN 057/10. It implemented a special pay program for qualified clinical psychologists, clinical social workers, and physician assistants. The special pay program included an accession bonus, an incentive pay, a retention bonus and board certification pay. For the purposes of this research, the focus is on the retention bonus.

d. NAVADMIN 074/10

The effective date of the special pay program established in NAVADMIN 057/10 was corrected in NAVADMIN 074/10. The effective date of the program was altered to 1 October 2009 from 23 July 2009.

B. DATA RESTRICTIONS

This research focuses on the effect special pays have on retention in the MSC. This research examines newly commissioned officers from their accession point through their initial decision to continue service. Since the data represented nine years of observations, it was limited in its ability to measure the effect of special pays on retention of more senior MSC Officers. The intention of this research was to study officers who entered the service between 1997 and 2006. Specifically, to examine their stay/leave decisions who have been directly affected by the recent changes made to MSC special pays. However, this approach resulted in a comparatively small number of officers in each of the specialties that received a special pay.

The BUMIS dataset does not take into account a multitude of variables that could have an effect on retention. These additional variables included marital status, number of dependents, demographic indicators, and any information on the role of the Global War on Terrorism (GWOT).

The special pay information used to conduct the research allowed for an overall analysis of the effect of special pays on retention, but it did not allow for an analysis of the effect of graduating amounts of special pay. Additionally, the data used in this study was limited to the period through FY2010.

C. DESCRIPTIVE STATISTICS

The dependent variable utilized for this study was LEAVE, a binary variable that indicates whether an officer remained in or left the service after their initial obligation. The independent variables included to study the effects on retention included gender, MSC specialty, rank, race, source of commission, loss reason, and educational level attained. The descriptive statistics for each of variables associated with the BUMIS dataset are shown in Table 2.

Table 2. Descriptive Statistics

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
leave	1833	0.4457174	0.4971803	0	1
Gender					
male	1833	0.6546645	0.4756073	0	1
female	1833	0.3453355	0.4756073	0	1
Specialty					
specialtywosp	1833	0.7877796	0.4089916	0	1
psychologist	1833	0.0632842	0.2435399	0	1
optometry	1833	0.0720131	0.2585801	0	1
pharmacy	1833	0.0703764	0.2558502	0	1
Rank					
ens	1833	0.0016367	0.0404336	0	1
ltjg	1833	0.0332788	0.1794125	0	1
lt	1833	0.6508456	0.4768329	0	1
lcdr	1833	0.2853246	0.4516921	0	1
cdr	1833	0.0278232	0.164511	0	1
Race					
white	1833	0.6901255	0.4625679	0	1
black	1833	0.1713039	0.3768771	0	1
other	1833	0.1249318	0.3307318	0	1
Commission Source					
dirproc	1833	0.4708129	0.4992836	0	1
hscp	1833	0.2013093	0.4010881	0	1
fmenl	1833	0.2400436	0.4272263	0	1
othersource	1833	0.0851064	0.2791161	0	1
Educational Level					
bachelor	1833	0.1985816	0.3990411	0	1
doctorate	1833	0.2465903	0.4311437	0	1
masters	1833	0.4757229	0.4995466	0	1

The gender variable denotes how many officers in the dataset are male or female. As expected the majority of officers are male (65.5%).

The specialty variables indicate which of the MSC specialty areas associated with each officer belongs. The specialties which do not receive a special pay (specialtywosp) included all of the healthcare administration and research specialties, and clinical care specialties not individually listed. Each of the additional specialties is listed individually to aide in studying the effects of special pays on their retention. The percentages of officers in each category are in line with expectations, with the specialties that do not receive a special pay making up the majority of the MSC.

The rank variable denotes the current rank for an officer in the dataset. As expected, the majority (65%) of the officers are Lieutenants (LT). The majority of MSC Officers have attained the rank of LT by the point at which they reach their initial decision to stay or leave, but have not reached the rank of Lieutenant Commander (LCDR). The race variable (black, white, other) denotes the racial background of each of the officers in the dataset. As expected the majority of officers were white, with the remainder split evenly between black and other (contains all remaining racial backgrounds).

The source of commissioning variable details the method by which the officer entered the service. The majority of officers were brought into the service through direct procurement, while the Health Services Collegiate Program (HSCP) and former enlisted methods make up the majority of the remainder.

The education variable notes the level of education attained by each of the officers in the dataset. As expected, the majority of the officers have a master's degree, while a significant portion has attained a doctorate. This increased educational attainment can be attributed to the requirements of the healthcare specialties in which these officers practice.

D. SUMMARY

The policy guidance and data utilized in this research provide the basis on which to analyze the effect special pays have on retention in the MSC. An initial examination of the data allows for a better understanding of the personnel accessing into the MSC, and a preliminary guide to the factors that may have an effect on retention. The next chapter will provide a more in depth discussion of the methodology and variables utilized to answer the primary and secondary research questions.

IV. METHODOLOGY

A. MODEL DESIGN

In order to determine if special pays have an effect on retention in the Medical Service Corps (MSC,) several regression models were constructed. The models utilized a probit regression since the dependent variable (LEAVE) was a binary variable with values of either zero or one.

In addition to the probit regression used for each model, an equivalent dprobit regression was also constructed. The use of a dprobit regression allows for the calculation of partial effects. The calculation of partial effects provides the expected effect on retention for an individual officer with set characteristics. In each of the models, the comparison values are for an officer with the traditional characteristics found in a MSC officer – white, male, and from a specialty that does not receive a special pay. The dprobit model calculates the effects of having values that differ from the comparison values. For this study, the primary focus is on the effects of being in a specialty that does receive a special pay, and the effects before and after that special pay was implemented.

A difference in difference estimator was added to each model and allows for an analysis of the effects of one group against another and over time. The estimator thereby compares the effects of a treatment versus a control group over time. The difference in difference estimator used in the models provided a method by which to test both the effects of specialties that do not receive a special pay against ones that do, and the effects before and after the special pays were implemented. By utilizing this estimator, it is possible to determine if inherent differences exist in the stay/leave decision for members of different specialties. In addition, the estimator examines if a difference in retention exists before and after the special pay was established. The calculation of these two effects isolates whether or not special pays have an effect on retention in the MSC, and if any effect is statistically significant.

B. MODEL SPECIFICATION

1. Basic Model

The basic model utilized for this study was constructed in order to study the effects of special pays on retention for the specialties who receive a special pay. The model utilized a difference in difference estimator in order to compare the specialties with a special pay against the specialties that do not receive a special pay and to compare before and after the special pays were received. The basic model utilized was:

$$\begin{aligned}\text{Leave} = {} & \beta_0 + \beta_1(\text{female}) + \beta_2(\text{ens}) + \beta_3(\text{ltjg}) + \beta_4(\text{lcdr}) + \beta_5(\text{cdr}) + \beta_6(\text{black}) + \\ & \beta_7(\text{other}) + \beta_8(\text{hscp}) + \beta_9(\text{fmenl}) + \beta_{10}(\text{othersource}) + \beta_{11}(\text{doctorate}) + \\ & \beta_{12}(\text{masters}) + \beta_{13}(\text{specialtywsp}) + \beta_{14}(\text{fy98}) + \beta_{15}(\text{fy99}) \\ & + \beta_{16}(\text{fy00}) + \beta_{17}(\text{fy01}) + \beta_{18}(\text{fy02}) + \beta_{19}(\text{fy03}) + \beta_{20}(\text{fy04}) + \beta_{21}(\text{fy05}) + \\ & \beta_{22}(\text{fy06}) + \beta_{23}(\text{fy07}) + \beta_{24}(\text{specialtywspafter})\end{aligned}$$

where:

Female = Officer being female

ENS = Officer currently holding the rank of ENS

LTJG = Officer currently holding the rank of LTJG

LCDR = Officer currently holding the rank of LCDR

CDR = Officer currently holding the rank of CDR

Black = Officer being black (African-American)

Other = Officer being a race other than black or white

HSCP = Officer having a commission source of the Health Services Collegiate Program

FmEnl = Officer having a commission source of Former Enlisted

OtherSource = Officer having a commission source other than HSCP, FmEnl or Direct Accession

Doctorate = Officer holding the educational degree level of doctorate

Masters = Officer holding the educational degree level of masters

SpecialtyWSP = Officers belonging to a MSC specialty that receives a special pay

FYXX = fiscal year variables constituting the years of the study

SpecialtyWSPAfter = Officers belonging to a MSC specialty that receives a special pay during the years the special pay was received

2. Refined Models

The refined models were constructed in order to examine the effects of special pays on retention for the individual specialties who receive a special pay. The model utilized a difference in difference estimator in order to compare the individual specialties with a special pay before and after the special pays were received. The three refined models utilized were:

$$\begin{aligned}\text{Leave} = {} & \beta_0 + \beta_1(\text{female}) + \beta_2(\text{ens}) + \beta_3(\text{ltjg}) + \beta_4(\text{lcdr}) + \beta_5(\text{cdr}) + \beta_6(\text{black}) + \\ & \beta_7(\text{other}) + \beta_8(\text{hscp}) + \beta_9(\text{fmenl}) + \beta_{10}(\text{othersource}) + \beta_{11}(\text{doctorate}) + \\ & \beta_{12}(\text{masters}) + \beta_{13}(\text{psychologist/pharmacy/optometry}) + \beta_{14}(\text{fy98}) + \beta_{15}(\text{fy99}) \\ & + \beta_{16}(\text{fy00}) + \beta_{17}(\text{fy01}) + \beta_{18}(\text{fy02}) + \beta_{19}(\text{fy03}) + \beta_{20}(\text{fy04}) + \beta_{21}(\text{fy05}) + \\ & \beta_{22}(\text{fy06}) + \beta_{23}(\text{fy07}) + \beta_{24}(\text{psychwsp/pharmwsp/optwsp})\end{aligned}$$

where:

Psychologist/Pharmacy/Optometry = Officers belonging to the MSC specialties of either Psychology, Pharmacy, or Optometry

PsychWSP/PharmWSP/OptWSP = Officers belonging to the MSC specialties of either Psychology, Pharmacy, or Optometry during the time period in which these specialties received a special pay

C. VARIABLE DEFINITIONS AND EXPECTED EFFECTS

1. Dependent Variable (LEAVE)

The dependent variable in each of the models was a binary variable that measured whether or not an individual officer stayed in the service (assigned a value of 0) or left the service (assigned a value of 1). Individual officers that accessed into the MSC during

the timeframe of this study undertook an initial commitment of three years. In effect, three years from their initial accession each officer would reach the initial stay/leave decision.

2. Explanatory Variables

a. Gender (Female, Male)

The gender of an officer is illustrated in the models by the female variable. Each of the officers in the MSC can be either male or female, with approximately 65% of the officers in the study cohort being male. An officer being female is expected to decrease the probability of retention. Female officers historically have left the service at higher rates than their male counterparts, and female officers serving in the MSC are no different.

b. Rank (ENS, LTJG, LT, LCDR,CDR)

The rank variable presents the rank held by each individual officer. The base rank in each of the models is LT. The majority of officers in the study held the rank of LT (65.4%).As an officer is promoted to higher ranks, the officers' corresponding years of service also increase. These factors lead to an expected increase in the probability of retention for an officer as rank increases.

c. Race (White, Black, Other)

The race variable identifies the racial background for each of the individual officers in the study. Each of the officers in the study can have a racial background of white, black, or other, with white being the comparison value. Historically, personnel from a minority racial background (black, other) have an increased retention rate in comparison to personnel with a white racial background. This effect is expected to exist for officers, and in the case of this study, specifically MSC Officers.

d. Source of Commissioning (Dirproc, Fmenl, HSCP, OtherSource)

As discussed in the introduction to this study, officers have several paths to accession in the MSC. Officers without previous military service can access either through the Health Services Collegiate Program (HSCP), direct procurement (Dirproc) or by another source (OtherSource). Officers who previously served as enlisted members access as former enlisted (Fmenl). Officers who were former enlisted members are expected to have increased retention rates. Former enlisted members' access to the Officer Corps, with previous years of service, increase their probability of serving until they have reached retirement eligibility. In comparison, officers who access without previous service have not established either years towards retirement or a known preference for military service.

e. Specialty (SpecialtyWOSP, Psychologist, Pharmacy, Optometry)

As previously detailed, the MSC has over 30 specialties in three major concentrations. While each of the specialties is in the healthcare field, the education requirements and job facets can vary greatly across specialties. The models in this study utilize the compiled specialties that do not receive a special pay (specialtywosp) as the comparison value. The specialtywosp variable included all of the healthcare administration and research specialties along with the clinical care specialties that do not receive a special pay. The expected effects for the various specialties are dependent on a multitude of factors to include the prevalence of civilian opportunities, the workplace environment, and the corresponding deployment rates. In reference to these factors, the specialties that do not receive a special pay are expected to have an increased probability of retention where as the clinical specialties that do receive a special pay (pharmacy, optometry, psychologists) are expected to have a decreased probability of retention.

f. Educational Level (Doctorate, Masters, Bachelor)

The healthcare industry by its very nature is a field that requires individuals to be highly educated and possess specialized skills. The majority of the specialties in the MSC require a doctorate or masters educational degree as a prerequisite

to practice in that specialty. Since the educational level of an individual officer is determined by the requirements of their specialty, the expected effect for each educational level can be expected to be in line with the effect for each corresponding specialty.

V. RESULTS

A. INTRODUCTION

The data and models utilized for this study were constructed to determine if special pays have an effect on retention in the MSC. The basic model examines if differences exist in the retention of specialties that do not receive a special pay in comparison to specialties that receive a special pay, and if a difference exists before and after the special pays were implemented. The three refined models examine whether or not retention differences exist for the individual specialties that receive a special pay, and if differences exist before and after their special pays were implemented.

B. MODEL STRENGTH

The probit regression models utilized in this study utilize a pseudo r squared in order to test the strength of each model. The pseudo r squared measures the power at which the model explains the results of the dependent variable (LEAVE), in this case the decision to stay or leave the military. The pseudo r squared results for each of the models constructed for this research is presented in Table 3.

Table 3. Pseudo R Squared Values

Model	**Pseudo-R^2**
Specialty W/ Special Pay	0.4138
Psychologist	0.4093
Pharmacy	0.4101
Optometry	0.411

The pseudo r squared values presented in Table 3 illustrate that the strength of both the basic and refined models were very similar. The pseudo r squared values show that the models used in this research have significant explanatory power, but are not perfect predictors of an officers' stay/leave decision. The models are known to be

missing potential explanatory variables including demographic variables (ex: marital status and number of dependents) and variables representing the effect of deployment. In addition, the models take into account a limited time span that restricts the strength of each model. One of the effects of a limited time span is that it reduces the number of officers in each specialty. Most notably, the specialties that receive a special pay are traditionally small specialties and only constitute approximately 20% of the officers in the study.

C. PRESENTATION OF EFFECTS AND PARTIAL EFFECTS

The results of the basic model and three refined models are shown in Table 4. The probit and dprobit results for the basic model are presented in the first two columns of Table 4, with the results for each refined model being presented across the remaining columns.

Table 4. Model Results

	Probit	**dProbit**	**Probit**	**dProbit**	**Probit**	**dProbit**	**Probit**	**dProbit**
VARIABLES	**leave**	**leave**	**leave**	**leave**	**leave**	**leave**	**leave**	**leave**
female	0.313***	0.124***	0.330***	0.130***	0.340***	0.134***	0.344***	0.136***
	(0.0791)	(0.0311)	(0.0791)	(0.0311)	(0.0785)	(0.0309)	(0.0785)	(0.0309)
ens	0.491	0.193	0.445	0.176	0.439	0.174	0.433	0.171
	(0.6890)	(0.2610)	(0.6900)	(0.2650)	(0.6890)	(0.2640)	(0.6870)	(0.2650)
ltjg	1.033***	0.377***	0.987***	0.364***	1.004***	0.368***	1.032***	0.377***
	(0.2420)	(0.0687)	(0.2400)	(0.0711)	(0.2420)	(0.0702)	(0.2440)	(0.0698)
lcdr	-2.505***	-0.684***	-2.508***	-0.683***	-2.506***	-0.685***	-2.492***	-0.681***
	(0.1240)	(0.0206)	(0.1240)	(0.0203)	(0.1240)	(0.0205)	(0.1230)	(0.0204)
cdr	-3.541***	-0.474***	-3.569***	-0.472***	-3.597***	-0.475***	-3.539***	-0.472***
	(0.2900)	(0.0156)	(0.2860)	(0.0155)	(0.2850)	(0.0156)	(0.2850)	(0.0154)
black	-0.00362	-0.00143	0.0119	0.0047	-0.00598	-0.00235	0.00757	0.00298
	(0.1090)	(0.0427)	(0.1080)	(0.0425)	(0.1080)	(0.0426)	(0.1080)	(0.0425)

	Probit	dProbit	Probit	dProbit	Probit	dProbit	Probit	dProbit
VARIABLES	**leave**	**leave**	**leave**	**leave**	**leave**	**leave**	**leave**	**leave**
other	-0.133	-0.0518	-0.116	-0.0453	-0.12	-0.0467	-0.112	-0.0438
	(0.1180)	(0.0452)	(0.1170)	(0.0451)	(0.1170)	(0.0452)	(0.1170)	(0.0452)
hscp	0.0977	0.0386	0.199**	0.0789**	0.123	0.0488	0.143	0.0567
	(0.1000)	(0.0398)	(0.1000)	(0.0398)	(0.1050)	(0.0418)	(0.0985)	(0.0391)
fmenl	-0.820***	-0.298***	-0.819***	-0.297***	-0.830***	-0.301***	-0.857***	-0.309***
	(0.1050)	(0.0334)	(0.1050)	(0.0334)	(0.1050)	(0.0332)	(0.1050)	(0.0329)
othersource	-0.0419	-0.0164	0.0948	0.0375	0.0721	0.0285	-0.119	-0.0463
	(0.1380)	(0.0540)	(0.1370)	(0.0544)	(0.1350)	(0.0534)	(0.1550)	(0.0596)
doctorate	0.497***	0.196***	0.699***	0.273***	0.711***	0.278***	0.671***	0.263***
	(0.1350)	(0.0524)	(0.1200)	(0.0450)	(0.1200)	(0.0449)	(0.1220)	(0.0461)
masters	0.00245	0.000966	-0.0455	-0.0179	-0.0358	-0.0141	-0.0442	-0.0174
	(0.0935)	(0.0368)	(0.0925)	(0.0363)	(0.0928)	(0.0365)	(0.0924)	(0.0363)
fy98	0.926***	0.350***	0.906***	0.344***	0.918***	0.347***	0.861***	0.329***
	(0.1960)	(0.0641)	(0.1940)	(0.0643)	(0.1940)	(0.0636)	(0.1930)	(0.0655)
fy99	0.666***	0.260***	0.652***	0.255***	0.652***	0.255***	0.607***	0.238***
	(0.1830)	(0.0676)	(0.1820)	(0.0676)	(0.1820)	(0.0673)	(0.1810)	(0.0681)
fy00	0.169	0.0668	0.134	0.0529	0.146	0.0579	0.107	0.0423
	(0.1760)	(0.0701)	(0.1750)	(0.0696)	(0.1750)	(0.0698)	(0.1750)	(0.0695)
fy01	-0.776***	-0.271***	-0.779***	-0.271***	-0.795***	-0.277***	-0.824***	-0.284***
	(0.1770)	(0.0513)	(0.1770)	(0.0508)	(0.1770)	(0.0506)	(0.1770)	(0.0494)
fy02	-0.902***	-0.308***	-0.893***	-0.305***	-0.916***	-0.312***	-0.937***	-0.317***
	(0.1710)	(0.0466)	(0.1710)	(0.0465)	(0.1710)	(0.0461)	(0.1710)	(0.0452)
fy03	-1.140***	-0.362***	-1.149***	-0.363***	-1.153***	-0.365***	-1.194***	-0.372***
	(0.1730)	(0.0386)	(0.1720)	(0.0379)	(0.1730)	(0.0382)	(0.1730)	(0.0367)
fy04	-1.510***	-0.430***	-1.523***	-0.431***	-1.488***	-0.427***	-1.592***	-0.440***
	(0.1790)	(0.0295)	(0.1750)	(0.0286)	(0.1770)	(0.0298)	(0.1780)	(0.0274)
fy05	-1.787***	-0.447***	-1.793***	-0.446***	-1.785***	-0.448***	-1.900***	-0.455***
	(0.1990)	(0.0231)	(0.1940)	(0.0225)	(0.1920)	(0.0227)	(0.1960)	(0.0210)
fy06	-1.912***	-0.454***	-1.861***	-0.448***	-1.848***	-0.449***	-2.011***	-0.459***
	(0.2110)	(0.0211)	(0.2030)	(0.0213)	(0.1990)	(0.0214)	(0.2060)	(0.0196)
specialtywsp	0.519***	0.205***						
	(0.1480)	(0.0571)						
specialtywspafter	-0.079	-0.0309						
	(0.2010)	(0.0779)						
psychologist			0.351*	0.139*				
			(0.2010)	(0.0791)				
psychwsp			-0.373	-0.139				
			(0.3430)	(0.1190)				
pharmacy					0.478**	0.189**		
					(0.2210)	(0.0848)		
pharmwsp					-0.541*	-0.195*		
					(0.3270)	(0.1030)		
optometry							0.198	0.0788
							(0.2080)	(0.0830)
optwsp							0.475	0.187*
							(0.2920)	(0.1120)
Constant	0.926***		0.947***		0.955***		1.022***	
	(0.1550)		(0.1540)		(0.1540)		(0.1550)	
Observations	1,832	1,832	1,832	1,832	1,832	1,832	1,832	1,832
Standard errors in parentheses								
***** p<0.01, ** p<0.05, * p<0.1**								

1. Basic and Refined Models

The basic model results show the effects of each of the explanatory variables on the stay/leave decision, which is represented by the leave variable. The focus in the basic model is on the effect of specialties that receive a special pay (specialtywsp) and the effect before and after special pays are implemented (specialtywspafter).

a. Explanatory Variables

The inclusion of additional variables besides the variables of interest strengthens the models. The gender variable was represented in the model by the value of female. As expected, an officer being female increases the probability of leaving when compared to an officer being male. The effects for female were statistically significant at the 0.01 level across all of the models.

The value for the rank variable is determined by the rank held by the individual officer. For each of the models, the rank of LT is the comparison value. officers that hold a rank below LT have an increased probability of leaving when compared to a LT, where as officers who hold a rank above LT have a decreased probability of leaving. The results for officers holding the rank of LTJG, LCDR and CDR were all statistically significant at the 0.01 level. These results are in line with the concept that as an officer is promoted to an ever higher rank their years of service and taste for the military decrease the probability that they will leave the service.

The race variable is represented by the values of black and other, with an officer being white as the comparison value. The results for race were in line with expectations as officers who are black or from other non-white backgrounds have a decreased probability of leaving. These values are in line with known historical patterns and could be explained by differing outside job opportunities, taste for military service, family history of military service, or by an additional unknown factor.

The variable for source of commissioning is portrayed in the models by the values of HSCP (Health Services Collegiate Program), fmenl (former enlisted members) and other source with the value of direct accession being the comparison value.

Officers who access through the HSCP were found to have an increased probability of leaving when compared to direct accession officers, however, these results were not statistically significant. Officers who were former enlisted or accessed through another source were found to have a decreased probability of leaving in comparison to an officer with a direct accession. The results for former enlisted members were statistically significant at the 0.01 level. A former enlisted member would be expected to continue service since they have shown a taste for military service, and have a vested number of years and interest in continuing service.

The educational level variable was represented in the model by the values of doctorate and masters with the comparison value being a bachelor degree. As previously stated the majority of officers in the MSC require a higher level of education based upon the specialty in which they serve. The results pointed to an increased probability of leaving for an officer with a doctorate when compared to an officer with a bachelor degree. This finding is statistically significant at the 0.01 level, and may be attributed to the potential for stronger civilian career opportunities for an officer with a higher level of education.

b. Variables of Interest

The basic and refined models utilized variables for specialties that receive a special pay and variables for each of the individual specialties in order to determine the effects of special pays on retention. The basic model utilized a variable for specialties that receive a special pay (specialtywsp) and a variable to study the before and after effects of special pays (specialtywspafter). As expected, officers who were members of a specialty that received a special pay (specialtywsp) were found to have an increased probability of leaving, and these results were statistically significant at the 0.01 level. The results for officers in a specialty that received a special pay after the special pay was implemented (specialtywspafter) found that the probability of leaving decreased when compared to an officer in a specialty that received a special pay but in a time period before the special pay was implemented. This decrease in the probability of leaving was not found to be statistically significant.

The refined models studied the effects of special pays on retention for psychologists, pharmacists and optometrists. An officer having a psychologist specialty was found to have an increased probability of leaving when compared to officers in other specialties. This finding was statistically significant at the 0.1 level. Officers that were a psychologist after the special pay was implemented had a decreased probability of leaving when compared to officers that were psychologists before the special pay was implemented. The effect attributed to before and after the special pay was implemented was not found to be statistically significant.

The refined model for pharmacists found that a pharmacist has an increased probability of leaving when compared to officers in other specialties. This finding was significant at the 0.05 level. Results showed that when an officer was a pharmacist after the special pay was implemented the probability of leaving decreased when compared to being a pharmacist before the special pay was implemented. This finding was statistically significant at the 0.1 level.

The final refined model studied the effects of special pays on optometrists. An officer having an optometry specialty increased the probability of leaving when compared to officers in other specialties. This result was not found to be statistically significant. Officers who were in the optometry specialty after the special pay was implemented were found to have an increased probability of leaving when compared to optometrists before the special pay was implemented. This last result was statistically significant for the dprobit model at the 0.1 level. This increase in the probability of leaving illustrates an unexplained model issue. The finding could be the result of an unknown factor in the stay/leave decision for optometrists during the time period of this study. Further research into the effect of special pays on the retention of optometrists is warranted.

2. Partial Effects

The use of a dprobit model allows for the calculation of partial effects. Partial effects calculate the increased or decreased probability of leaving for an individual with set characteristics against an individual having the comparison values. In the basic

model, officers who belong to a specialty that receives a special pay were compared to officers who belong to a specialty that does not receive a special pay. As expected, the findings from this model found that officers in a specialty with special pay (specialtywsp) have an increased probability of 20.5% of leaving the service. This finding is statistically significant at the 0.01 level. When officers belonging to a specialty that receives a special pay are compared before and after the special pay (specialtywspafter) is implemented, officers in the after category have a 3.09% decreased probability of leaving the service. This result was not found to be statistically significant.

The refined models compared the effects of being in an individual specialty for psychologists, pharmacists, and optometrists. In the model studying psychologists, it was determined that a psychologist has a 13.9% increased probability of leaving the service when compared to an individual in another specialty. This finding was significant at the 0.1 level. The model studying psychologists also determined that a psychologist after the special pay was implemented (psychwsp) has a 13.9% decreased probability of leaving, however, this result is not found to be statistically significant.

The refined model for pharmacists found that a pharmacist has an 18.9% increased probability of leaving the service when compared to an officer in a different specialty. This result was statistically significant at the 0.05 level. A pharmacist after the special pay was implemented (pharmwsp) was found to have a 19.5% decreased probability of leaving when compared to a pharmacist before the special pay was implemented. This second finding was statistically significant at the 0.1 level.

The final refined model studied the effects of special pays on optometrists. An optometrist was found to have a 7.88% increased probability of leaving the service when compared to an officer in a different specialty, however, this result was not shown to be statistically significant. A comparison of optometrists before and after the special pay was implemented found that optometrists after the special pay have an increased probability of leaving of 18.7%. This final result was statistically significant at the 0.1 level. As discussed in the above section this increased probability of leaving for optometrists after the special pay was implemented is problematic. Further research in this field is warranted.

D. SUMMARY

The data and models in this study were utilized to generate results that would allow an analysis of the effects of special pays on retention in the MSC. The generated results have shown that special pays have a positive effect on retention, with the exception of optometrists. These results point to the effectiveness of the special pays program, however, additional research as described in the next chapter is warranted.

VI. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

The retention of Medical Service Corps (MSC) Officers is critical for the Navy to meet its staffing goal mission. This study examined whether or not special pays have a significant effect on retention in the MSC. The research examined several factors that may affect the stay/leave decisions of individual officers.

This research concluded that special pays do have a statistically significant effect on retention in the MSC but varied by model and situation. Research findings determined that specialties that receive a special pay have a 20.5% increased probability of leaving the service when compared to specialties that do not receive a special pay. For individual specialties, psychologists, pharmacists, and optometrists were shown to have an increased probability of leaving of 13.9%, 18.9%, and 7.88% respectively. The variances in these effects show that each specialty has a different stay/leave decision.

In addition, the research determined that when special pays are implemented they have a positive effect on retention for specialties that receive a special pay, and specifically for pharmacists and psychologists. The size of this effect was 19.5% and 13.9% respectively. When special pays are implemented for optometrists, they were not shown to have a positive effect on retention, a finding that will need to be examined through further research. Additionally, it can be reasonably conceived that the effects determined for these specialties should apply if special pays were implemented for specialties that currently do not receive one.

The research findings can be utilized to draw conclusions to the research questions, and generate recommendations moving forward.

B. CONCLUSIONS AND RECOMMENDATIONS

1. Primary Research Question 1

Does special pay have a statistically significant effect on retention rates in the Medical Service Corps?

a. Conclusion

The results from the basic model showed specialties that receive a special pay do have a statistically significant decrease in the probability of retention when compared to specialties that do not receive special pay. Additionally, during the period when special pays were implemented for these specialties there is an increased probability of retention, however, it was not found to be statistically significant.

The refined models were constructed in order to determine the effect of special pays on individual specialties. The first model concluded that psychologists were shown to have a statistically significant decreased probability of retention when compared to other specialties. Further, when psychologists received a special pay their corresponding probability of retention increased, however, this second result was not statistically significant. The second model concluded that pharmacists were shown to have a statistically significant decreased probability of retention when compared to other specialties. In addition, the period in which pharmacists received a special pay their probability of retention increased significantly. The final model concluded that optometrists have a decreased probability of retention when compared to other specialties. The results also showed a significant decrease in the probability of retention after optometrists received a special pay.

b. Recommendation

In order to better understand the effect special pays have on retention in the MSC, Navy Medicine Manpower, Personnel, Training and Education (MPTE) should conduct further research. Additional research should take into account demographic variables, such as marital status and number of dependents, and variables that take into account deployment and the war on terrorism.

In addition, future research that studies the effect of special pays on senior officers is warranted. In order to determine the overall effect special pays have on retention in the MSC, research that examines both junior and senior officers must be conducted.

2. Primary Research Question 2

What is the effect of special pay and its subsequent role in meeting Medical Service Corps retention goals?

a. Conclusion

The results of the models show that special pay may have a significant practical effect on the staffing of the MSC. The decreased probability of retention for specialties that receive a special pay illustrates that these specialties have inherent differences that could cause officers to make different stay/leave decisions than their non-special pay MSC counterparts. Each of the individual specialty results (with the exception of optometry) pointed towards an increased probability of retention when the special pays were in effect. This increased probability may lead to an actual increase in the retention of officers in these specialties, which in turn could have significant effects on the ability of the MSC to meet its staffing goals.

b. Recommendation

Navy Medicine MPTE should conduct further research to include cost data to show the effect of special pays on retention. This would predict the buying power of special pays, in effect how much retention is achieved for every dollar in special pays spent. Calculating the buying power would provide an additional metric, and allow the policy-maker to compare the effectiveness of special pays against other retention tools available to the MSC.

3. Secondary Research Question 1

How does the special pay effect on retention rates differ among Medical Service Corps specialties?

a. Conclusion

The results from the refined models show that with the exception of optometry, each of the individual specialties that received a special pay had an increased probability of retention during the period analyzed in which they received the special pay. This increased probability ranged from 13.9 % to 19.5%, with significant results for pharmacists. The varied effects special pay has on specialties may be attributed to the existence of inherent differences between specialties. Additionally, this effect may be explained by the differing levels of pay available by specialty.

b. Recommendation

Navy Medicine MPTE conduct further research. To include the policies and working understandings specialty community managers have to better understand the retention environment.

4. Secondary Research Question 2

If significant effects exist for specialties currently receiving a special pay, could potential effects on retention rates exist for those specialties not currently receiving a special pay?

a. Conclusion

The results showed a positive increase in the probability of retention for those specialties that currently receive a special pay, it can be reasonably conceived that extending the special pays to additional specialties should have a roughly equal effect. If the specialties not currently receiving a special pay are meeting their manning targets, implementing a special pay may not be the best tool in a limited resource environment.

b. Recommendation

Navy Medicine MPTE conduct another study to examine specialties not currently receiving special pay who only marginally meet retention demands. Future research would be prescribed when the specialties in question are at risk of not meeting their policy directed retention targets.

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

Dietrich, Erich J. (2007). Effects of the Global War on Terror on Medical Service Corps Retention Rates. Master's Thesis. Naval Postgraduate School, Monterey, CA.

Lane, M, N, and Melody, B, T. (1998). The Impact of Pay on Navy Physician Retention in a Health Care Reform Environment, Master's Thesis, Naval Postgraduate School, Monterey, CA.

May, Laurie J. and McMahon, Joyce S. (June 1989). Evaluation of Alternative Medical Special Pay Plans, Center for Naval Analyses.

May, Laurie J. and McMahon, Joyce S. (January 1990). Initial Effectiveness of the FY1989 Medical Officer Retention Bonus, Center for Naval Analyses.

McMahon, Joyce S. (June 1989). A Retention Model for Navy Physicians, Center for Naval Analyses.

NAVADMIN Message 172/03 (June 30, 2003). Pharmacy Officer Special Pay and Optometry Retention Bonus.

NAVADMIN Message 320/07 (November 30, 2007). Announcement of Medical Service Corps Clinical Psychology Critical Skills Retention Bonus Program.

NAVADMIN Message 020/09 (January 21, 2009). FY-09 Pharmacy Officer Special Pay Increase.

NAVADMIN Message 057/10 (February 19, 2010). Special Pay for Health Professions Officers of the Medical Service Corps.

NAVADMIN Message 074/10 (February 27, 2010). Health Professions Officers and Medical Service Corps Professions Officers Special Pays.

OPNAV Instruction 7220.17 (December 28, 2005). Special Pay for Medical Corps, Dental Corps, Medical Service Corps, and Nurse Corps Officers.

Shepherd, L. M. (2001). Medical Service Corps: Junior Officers and Recent Retiree Stay/Leave Decisions. Master's Thesis, Naval Postgraduate School, Monterey, CA.

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California

3. John Enns
   Naval Postgraduate School
   Monterey, California

4. William Hatch
   Naval Postgraduate School
   Monterey, California

5. Stephen Mehay
   Naval Postgraduate School
   Monterey, California

6. Christopher Lingard
   Naval Postgraduate School
   Monterey, California

7. CDR Brendan Melody
   Naval Hospital Bremerton
   Bremerton, Washington